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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/091,589	03/07/2002	Vijayen S. Veerasamy	3691-376	7654
23117	7590	02/25/2004	EXAMINER	
NIXON & VANDERHYE, PC 1100 N GLEBE ROAD 8TH FLOOR ARLINGTON, VA 22201-4714			ROSSI, JESSICA	
			ART UNIT	PAPER NUMBER
			1733	

DATE MAILED: 02/25/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

AS

<b>Office Action Summary</b>	<b>Application No.</b>	<b>Applicant(s)</b>	
	10/091,589	VEERASAMY, VIJAYEN S.	
	<b>Examiner</b>	<b>Art Unit</b>	
	Jessica L. Rossi	1733	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 12/1/03, Amendment.
- 2a) ☒ This action is **FINAL**.                      2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-3,5-18,36-39,41-46 and 55-59 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-3,5-18,36-39,41-46 and 55-59 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
a) ☐ All    b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |   |   |
|---|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)  | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)  | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date <u>11/17/03</u> . | 6) <input type="checkbox"/> Other: _____  |

**DETAILED ACTION**

***Response to Amendment***

1. This action is in response to the amendment dated 12/1/03. Claims 4, 19-35, 40, and 47-54 were canceled. Claims 55-59 were added. Claims 1-3, 5-18, 36-39, 41-46, and 55-59 are pending.
2. The rejection of claims 36-37, 39, 41, 45, 1-2, 6-7, and 12-14 under 35 U.S.C. 103(a) as being unpatentable over Veerasamy '506 (of record) in view of the Admitted Prior Art in the specification of the present application, or alternatively, the Admitted Prior Art in view of Veerasamy, as set forth in paragraph 4 of the previous office action dated 8/28/03, has been withdrawn in light of the amendment to the claims and Applicant's arguments in relation thereto; note Veerasamy teaches the DLC layer 3 and solar coating 5 on the same side of substrate.
3. The rejection of claims 36-37, 39, 43, 45-46, 1-2, 7, 10, and 12-16 under 35 U.S.C. 103(a) as being unpatentable over Veerasamy et al. '480 (of record) in view of Veerasamy '506 and the Admitted Prior Art, as set forth in paragraph 10 of the previous office action, has been withdrawn because of the amendment to the claims; note '408 teaches the solar coating 7 on the same side as the DLC layer 3 (column 12, lines 3-7).
4. The rejection of claims 36-39, 42-44, 45, 1-3, 7, 9-11, and 12-14 under 35 U.S.C. 103(a) as being unpatentable over Kimock et al. (of record) in view of the Admitted Prior Art and Veerasamy '506, as set forth in paragraph 15 of the previous office action, has been withdrawn because of the amendment to the claims; note Kimock teaches layer 4 can be a solar coating and layer 4 is located on the same side of the substrate as DLC layer 3 (column 9, lines 23-28).

***Claim Rejections - 35 USC § 112***

5. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

6. Claims 1-3, 5-18, 36-39, 41-46, and 55-58 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

With respect to claims 1 and 36, the present specification has support for heat treating the glass substrate with the DLC layer and protective layer thereon, but it does not have support for the solar coating also being on the glass substrate during this heat treating.

***Claim Rejections - 35 USC § 103***

7. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

8. Claims 1-3, 5-7, and 12-14 are rejected under 35 U.S.C. 103(a) as being obvious over either one of Thomsen et al. (US 2003/0113551) or Thomsen et al. (US 2003/0064198) in view of Veerasamy (WO 00/66506; of record).

The applied references to Thomsen et al. have a common inventor and assignee with the instant application. Based upon the earlier effective U.S. filing date of the reference, it constitutes prior art only under 35 U.S.C. 102(e). This rejection under 35 U.S.C. 103(a) might be overcome by: (1) a showing under 37 CFR 1.132 that any invention disclosed but not claimed in

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the reference was derived from the inventor of this application and is thus not an invention "by another"; (2) a showing of a date of invention for the claimed subject matter of the application which corresponds to subject matter disclosed but not claimed in the reference, prior to the effective U.S. filing date of the reference under 37 CFR 1.131; or (3) an oath or declaration under 37 CFR 1.130 stating that the application and reference are currently owned by the same party and that the inventor named in the application is the prior inventor under 35 U.S.C. 104, together with a terminal disclaimer in accordance with 37 CFR 1.321(c). For applications filed on or after November 29, 1999, this rejection might also be overcome by showing that the subject matter of the reference and the claimed invention were, at the time the invention was made, owned by the same person or subject to an obligation of assignment to the same person. See MPEP § 706.02(l)(1) and § 706.02(l)(2).

*\*Please note that US 2003/0064198 to Thomsen et al. is a CIP of US 2003/0113551 and includes all the teachings of US '551 that are relied upon in the rejections set forth below. Therefore, the examiner is only citing portions of the '551 reference.*

With respect to claim 1, Thomsen is directed to making a coated glass article, such as a windshield or IG window (section [0049]). The reference teaches providing a glass substrate 1, forming a DLC layer 5a on the substrate (Figure 11; section [0049]), sputtering a solar control multi-layer coating 5 onto another surface of the substrate so that the solar coating and the DLC layer are on opposite sides of the substrate (Figure 11; section [0044] and [0048]), heat treating the substrate with the DLC layer and solar coating thereon, wherein the heat treating is sufficient for thermal tempering, and thereafter coupling the glass substrate with the DLC layer thereon to another substrate to make an IG window (section [0040]). The reference is silent as to forming a

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protective layer over the DLC layer and heat-treating the substrate with the protective layer thereon.

It is known in the art to make a coated glass article, such as an IG window, wherein a DLC layer is provided on one surface of the glass substrate and a protective layer is provided over the DLC layer to prevent burn-off the same during high temperature heat-treating, as taught by Veerasamy (p. 37, lines 11-20).

Therefore, it would have been obvious to the skilled artisan at the time the invention was made to provide a protective layer over the DLC layer of Thomsen and heat treat the coated substrate of Thomsen with the protective layer thereon because such is known in the art, as taught by Veerasamy, and this would prevent burn-off of the DLC layer during heating.

Regarding claim 2, selection of a deposition technique for the DLC layer would have been within purview of the skilled artisan at the time the invention was made. However, it would have been obvious to use ion beam deposition because such is known in the art for depositing DLC on a glass substrate, as taught by Veerasamy (p. 16, lines 10-12).

Regarding claim 3, Veerasamy is silent as to how the protective layer is coated onto the DLC layer. Selection of a particular technique would have been within purview of the skilled artisan. However, since Thomsen teaches sputtering the solar coating 5 and sputtering is a well-known and conventional coating technique, it would have been obvious to the skilled artisan to sputter the protective coating because only the expected results would have been achieved.

Regarding claim 5, Thomsen teaches the solar coating comprising at least first and second dielectric layers and an IR reflecting layer comprising one of Ag and NiCr provided between the dielectric layers (Figure 6; section [0044]).

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Regarding claim 6, Veerasamy teaches removing at least part of the protective layer after heating (p. 38, lines 1-2) but is silent as to whether or not this takes place before or after coupling the substrate to the other substrate. Such would have been within purview of the skilled artisan at the time the invention was made.

Regarding claim 7, Thomsen teaches the heating being a thermal tempering process (section [0040]).

Regarding claim s 12-13, Thomsen teaches heating to at least 580°C (section [0040]).

Regarding claim 14, Thomsen is silent as to the type of DLC. It would have been obvious to use a DLC layer comprising amorphous DLC having more sp<sup>3</sup> carbon-carbon bonds than sp<sup>2</sup> because such is known in the art, as taught by Veerasamy (p. 8, lines 5-6), wherein this type of DLC is well suited for coated glass articles.

9. Claims 36-39, 41, and 45 are rejected under 35 U.S.C. 103(a) as being unpatentable over either one of Thomsen et al. '551 or Thomsen et al. '198 and Veerasamy as applied to claim 1 above, and further in view of the Admitted Prior Art in the specification of the present application.

With respect to claim 36, all the limitations were addressed above with respect to claims 1, 5, and 13 except heating taking place in an atmosphere including oxygen.

It appears Applicants are teaching it is known in the art to coat a glass article, to be used in an IG window, and then heat the coated article to a temperature of at least 600°C in an oxygen environment for a period of time that enables thermal tempering of the same (p. 1, [003]).

Therefore, it would have been obvious to perform the heating of Thomsen in an environment

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including oxygen because such is known in the art, as taught by the Admitted Prior Art, wherein such an environment works well for glass tempering.

Regarding claim 37, please refer to claim 2 above. Veerasamy also teaches the carbon atoms being subimplanted into the glass (p. 16, lines 10-12).

Regarding claim 38, please refer to claim 3 above.

Regarding claim 39, please refer to claim 1 above.

Regarding claim 41, please refer to claim 6 above.

Regarding claim 45, please refer to claim 14 above.

10. Claims 8-11, 55-56, and 59 are rejected under 35 U.S.C. 103(a) as being unpatentable over either one of Thomsen et al. '551 or Thomsen et al. '198 and Veerasamy as applied to claim 1 above, and further in view of the collective teachings of Ebisawa et al. (US 6451434; of record) and Lingle et al. (US 5688585; of record).

Regarding claims 8-10, Veerasamy is silent as to the protective layer being these materials. However, the reference does teach the protective layer can be **any suitable material** for preventing burn-off of the DLC layer during heating (p. 38, lines 1-2).

The prior art has recognized the need to protect coated glass substrates during high temperature heat-treating steps, which enable tempering, bending, etc. of the coated glass, in order to prevent degradation of the coating. The prior art accomplishes this goal by sandwiching the coating layers between a variety of protective layers having high-temperature resistance such as oxides, nitrides, and carbides of zirconium, silicon, titanium, etc., as taught by the collective teachings of Ebisawa (column 3, lines 23-26 and 32-36 and 43-45; column 4, lines 25-26;



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column 5, lines 62-67; column 8, lines 50-66; column 9, lines 1-2) and Lingle (column 1, lines 40-65; column 5, lines 28-32; column 11, lines 8-14).

Selection of a particular material for the protective layer of Thomsen in view of Veerasamy would have been within purview of the skilled artisan. However, one reading the reference as a whole would have appreciated that the particular type of protective layer is not critical to the invention, provided it can perform the necessary function of preventing burn-off of the DLC layer, and therefore it would have been obvious to use the materials taught by the collective teachings for the protective layer of Thomsen in view of Veerasamy because their high-temperature resistance would only produce the expected results of preventing burn-off the DLC layer.

Regarding claim 11, selection of particular amounts of each component present in the compounds would have been within purview of the skilled artisan at the time the invention was made.

Regarding claims 55-56, Ebisawa teaches the protective layer can be zirconium carbide (column 5, lines 62-66).

With respect to claim 59, all the limitations were addressed with respect to claims 1 and 55.

11. Claims 42-44 and 57-58 are rejected under 35 U.S.C. 103(a) as being unpatentable over either one of Thomsen et al. '551 or Thomsen et al. '198, Veerasamy, and the Admitted Prior Art as applied to claim 36 above, and further in view of the collective teachings of Ebisawa et al. and Lingle et al.

Regarding claims 42-43, please refer to claims 9-10 above.

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Regarding claim 44, please refer to claim 11 above.

Regarding claims 57-58, please refer to claims 55-56 above.

12. Claims 15-16 are rejected under 35 U.S.C. 103(a) as being unpatentable over either one of Thomsen et al. '551 or Thomsen et al. '198 and Veerasamy as applied to claim 14 above, and further in view of Veerasamy et al. (US 6277480; of record).

Regarding claims 15-16, Thomsen is silent as to the DLC layer's hardness. Selection of a particular hardness would have been within purview of the skilled artisan at the time the invention was made. However, it would have been obvious to use a DLC layer having a hardness consistent with that claimed in the present invention because such is known in the art, as taught by Veerasamy '480 (column 10, lines 9-26).

13. Claim 46 is rejected under 35 U.S.C. 103(a) as being unpatentable over either one of Thomsen et al. '551 or Thomsen et al. '198, Veerasamy, and the Admitted Prior Art as applied to claim 36 above, and further in view of Veerasamy et al. '480.

Regarding claim 46, please refer to claims 15-16 above.

14. Claims 17-18 are rejected under 35 U.S.C. 103(a) as being unpatentable over either one of Thomsen et al. '551 or Thomsen et al. '198 and Veerasamy '506 as applied to claim 1 above, and further in view of Yamasaki et al. (EP 0723944; of record).

Regarding claim 17, Thomsen is silent as to the properties of the DLC layer. It would have been obvious to use a DLC layer having the claimed density because such is known in the art, as taught by Veerasamy (p. 9, lines 1-2). It would also have been obvious to use a hydrogenated DLC because such is known in the art, as taught by Yamasaki et al. (p. 3, lines 39-40).

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Regarding claim 18, all the limitations were addressed with respect to claim 17 above except the DLC being highly tetrahedral amorphous carbon. It would have been obvious to use such a DLC layer because such is known in the art, as taught by Veerasamy '506 (p. 12, lines 2-3), and such exhibits excellent hardness.

15. Claim 59 is rejected under 35 U.S.C. 103(a) as being unpatentable over Kimock et al. (US 5635245; of record) in view of the Admitted Prior Art and Veerasamy '506.

With respect to claim 59, Kimock is directed to making coated glass articles, such as architectural windows (abstract). The reference teaches providing a glass substrate 1, forming a DLC layer 3 on the glass substrate, and forming a layer 4 on the DLC layer (Figure 3; column 1, lines 38-41; column 5, line 30; column 7, line 53 – column 8, line 1). The reference teaches layer 4 being a variety of materials comprising zirconium (column 7, line 53 – column 8, line 1). It is noted that the present invention also teaches the protective layer can be zirconium carbide (p. 9, [0031]); therefore, the skilled artisan would have appreciated that the layer 4 of Kimock would also serve as a protective layer for preventing burn-off of the DLC during heating at high temperatures that enable thermal tempering of the glass.

However, Kimock is silent as to heating the coated glass substrate to a temperature sufficient for thermal tempering and, after the heating step, coupling the substrate to another substrate to make the architectural window.

It would have been obvious to heat the coated glass substrate of Kimock to a temperature for a time period sufficient to enable thermal tempering because it is known in the art to do this to coated glass for IG windows, as taught by the Admitted Prior Art (p. 1-2; section [0003]), especially coated glass having a DLC layer thereon and which is to be used in IG windows, as

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taught by Veerasamy '506 (p. 37, lines 11-20), wherein tempering will impart desirable characteristics to the glass. One reading Veerasamy as a whole would have appreciated that coupling takes place after heating.

Kimock teaches the glass being used in an architectural window wherein the skilled artisan would have readily appreciated that such encompasses IG windows. However, if it is not taken as such, it would have been obvious to incorporate the coated glass substrate of Kimock into an IG window because such is known in the art, as taught by the Admitted Prior Art and Veerasamy (see previous paragraph), wherein such coated glass substrates impart desirable properties to an IG window.

#### *Response to Arguments*

16. Applicant's arguments with respect to all claims have been considered but are moot in view of the new ground(s) of rejection.

17. Please note that the present amendment of claims 1 and 36, specifically the solar coating and DLC layers being on opposite sides of the substrate and heat treating the substrate with the DLC layer, protective layer, **AND** solar coating thereon, has necessitated the new grounds of rejection using the Thomsen et al. '551 and '198 references.

#### *Conclusion*

18. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO**

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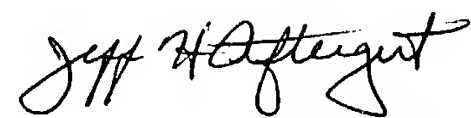
MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to **Jessica L. Rossi** whose telephone number is **571-272-1223**. The examiner can normally be reached on M-F (8:00-5:30) First Friday Off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Richard D. Crispino can be reached on 571-272-1226. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

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